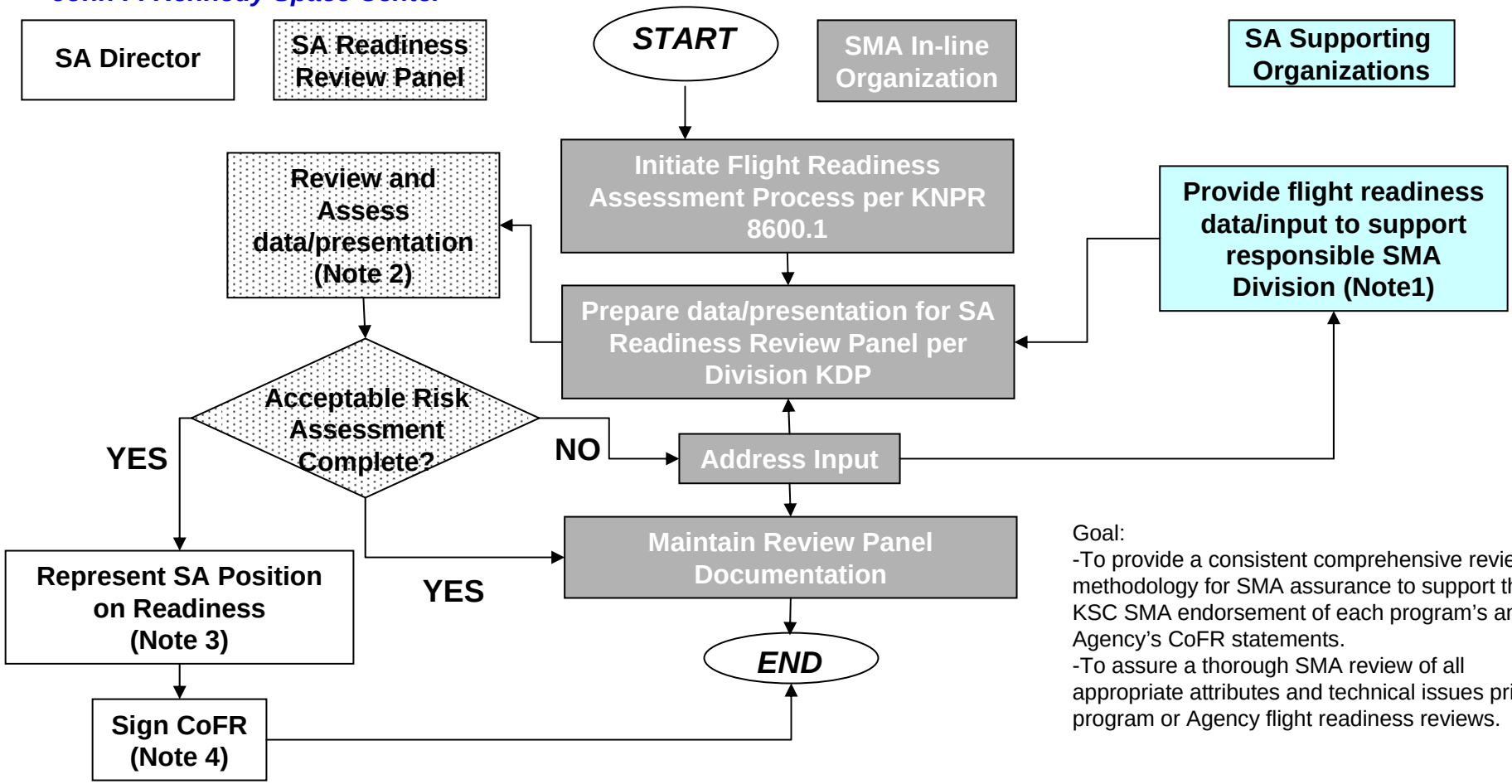
# *Launch Services Program Compliance Verification for Launch Vehicle Flight Readiness*

# KSC SMA Flight Readiness Process

John F. Kennedy Space Center

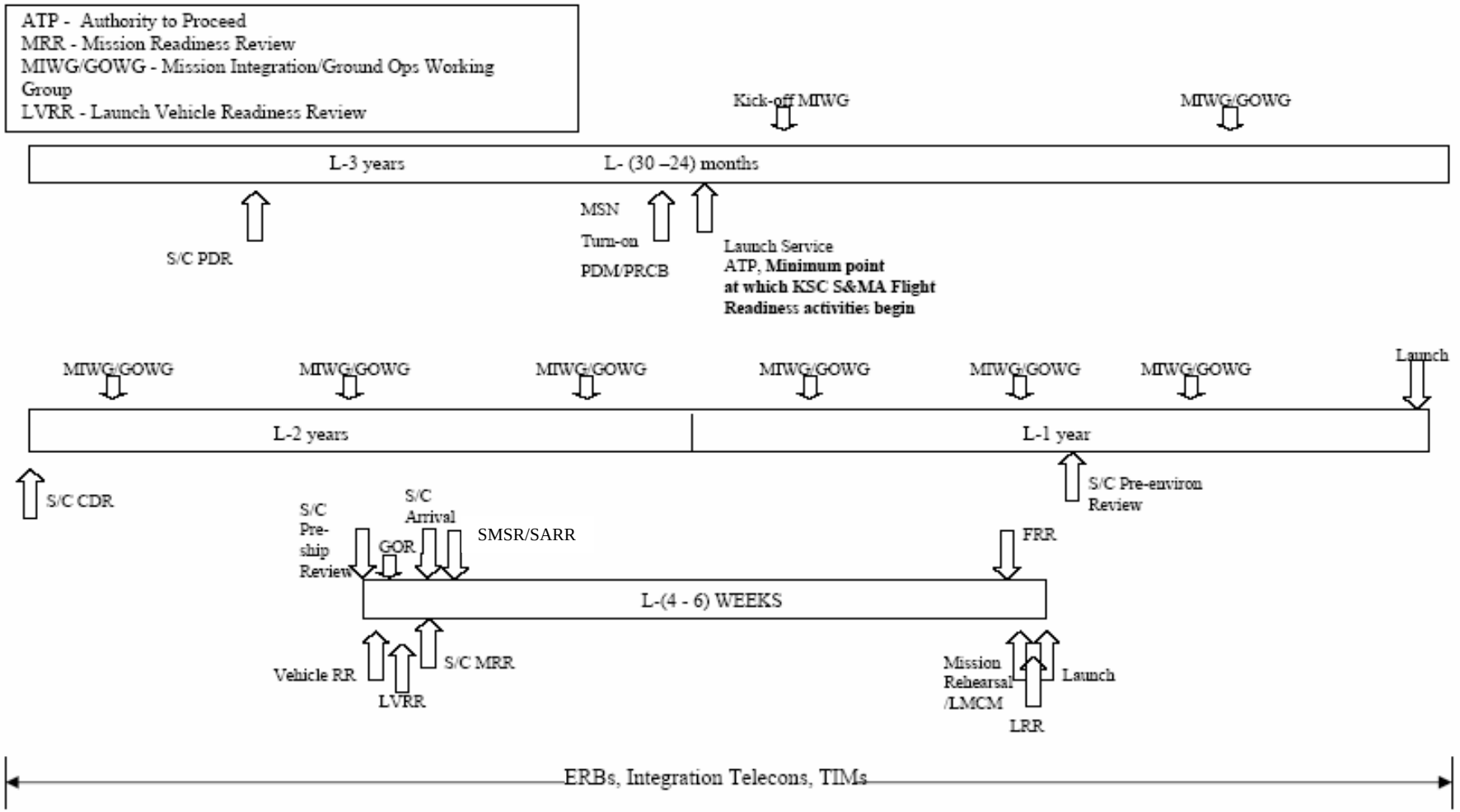



Goal:
-To provide a consistent comprehensive review methodology for SMA assurance to support the KSC SMA endorsement of each program's and the Agency's CoFR statements.
-To assure a thorough SMA review of all appropriate attributes and technical issues prior to program or Agency flight readiness reviews.

Note 1: Supporting organizations, both in SA and out, provide supporting information to a flight division's readiness input.
Note 2: The SA Readiness Review Panel meeting may be incremental, closing out items prior to the final meeting. These incremental meetings may provide support to programmatic pre-launch milestone reviews, but the intent of the SA Readiness Review is to prepare for final CoFR signature(s) by the SA Director.
Note 3: It is the responsibility of the SA Director to provide the KSC SMA position on flight readiness and communicate that position to the appropriate Center, Program and Agency authorities. The Director may delegate the representation and communication of the KSC SMA position as needed.
Note 4: It is the responsibility of the SA Director to provide the KSC SMA signature(s) certifying flight readiness to the appropriate Center, Program and Agency authorities. The Director may delegate the signature(s) certifying flight readiness as needed. *For expendable launch vehicle missions OSMA delegates CoFR responsibilities and signatures to KSC SMA*

# Mission Template

**Note: This template represents the "life-cycle" of a typical ELV mission (launch services)**



•Compliance Verification is inherent in LS-SMA's independent Flight Readiness Process. This is accomplished through:

- •Surveillance
- •Audits/Assessments
- •Evaluations
- •Watch Items
- •Risk Assessment

**Processes are Mature**

- **LS SMA independent opinion has become an inherent part of the LSP's risk management process**
  - **Example**
    - **OSC Quality Program concerns and risk instigated by their use of scrap hardware**
      - **Failure to comply with industry practices associated with the use of scrap hardware**
    - **Atlas V risk instigated by LS-SMA assessment that the RP-1 tank was built with a design flaw**
      - **Failure to comply with design practices**
      - **High plastic stresses and negative margins were not recognize**
      - **Departure of tank material properties from specification**
    - **Delta II second stage tank risk**
      - **Failure to comply with design requirements as a result of manufacturing/production processes**

## Resultant Products include:

- LS SMA SNAPSHOT
  - Documents mission specific LS SMA activities
    - Watch Item evaluations/assessments
    - Risk Assessments
- Directorate Readiness Review (SARR)
- Safety and Mission Success Review
- Independent Certification of Flight Readiness

# Background

# Minimum Attributes

| Assurance Verification Areas | Status | Evidence of Completion | Issues/Concerns |
|---|---|---|---|
| **Quality** | | | |
| Software / Hardware Problems | | | |
| Alerts | | | |
| Audits / Inspections / Surveillances | | | |
| Limited Life Items | | | |
| **Reliability** | | | |
| FMEA/Fishbone/Equivalent | | | |
| Reliability Assessments | | | |
| **Safety** | | | |
| Requirements Definition | | | |
| Range Safety and Mission Flight Rules | | | |
| Licenses/Use Authorizations | | | |
| Safety Documentation | | | |
| Non-Compliances | | | |
| Contingency Planning | | | |
| **Mission Assurance** | | | |
| Lessons Learned Review | | | |
| First Flight/Mission Unique Items | | | |
| Test/Qualification/Certification | | | |
| Mission Assurance Assessments (Risks) | | | |
| Risk Management | | | |

**Legend.**

- O.K.
- Minor Problem
- Major Problem
- Unaddressed